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U. S. AIR FORCE
PROJECT RAND
 RESEARCH MEMORANDUM

NRO Review Completed.

THE FEED BACK SIMULATION PICTURES
 TAKEN AT RCA (U)

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RM-1555

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-ii-SUMMARY

The purpose of this report is to present and make accessible the most interesting of the many hundreds of simulated Feed Back pictures. These pictures form the raw data for the photo interpretation study presented in R-262.

Since Project Feed Back is being continued as Project Pied Piper under Air Force cognizance it is expected that these pictures might provide a starting point for those persons concerned with future photo interpretation studies.

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-1-I. INTRODUCTION

Early in the Feed Back Project it was decided to study the interpretation phase by an empirical rather than an analytic method. This approach required the examination of a large sample of simulated pictures, rather than a fundamental study of the basic requirements for detection and recognition of familiar objects displayed with the television response characteristics. To obtain this sample, large quantities of Air Force aerial photography were examined and particular scenes selected for use. This selection was based on pictorial content, scale, season, and film type.

The simulated pictures were obtained by photographing the monitoring scope of a television chain in which conventional aerial photographs were being viewed at a distance by a television camera.

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One of the important parameters in the photo interpretation study is scale (meaning the ratio of object size on the ground to the image size on the photo sensitive element of the TV camera). With reference to the satellite the scale is determined by the altitude of the vehicle and the focal length of the television optical system. In most cases the aerial photograph was 9 x 9 in. and the optical system focussed so that the vertical dimension on the photo sensitive element of the TV camera was just filled by the 9 in. photograph. With this in mind the aerial photography was selected such that most of the simulated pictures fell in the scale interval 1:100,000 to 1:2,000,000.

Numerous oblique pictures were included to permit the viewing of the ground at different scales within the same frame. For analysis these have proved useful although it can be shown that the identical ground coverage could not be viewed in a single frame taken from a satellite.

Stereo pairs have been included so the affect of image degradation on three-dimensional viewing could be noted. Again it is clear that the simulation is not true (in the sense that the same vertical exaggeration and ground coverage could be obtained from the satellite) however they serve to illustrate the conclusion that most of the three-dimension illusion when observing interesting (man made) objects is lost due to the poor image quality. Examples of stereo coverage can be found as scene numbers 4, 5; 55, 56; 103, 104, 105; 118, 119; 151, 152, 154, 155; 208, 209, 210, 211, 212; 248, 249; 382, 384; 389, 390, 391.

Of particular interest are illustrations of repeated coverage since, in general, objects will look different at different times so it is risky

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to base conclusions on single photographs. The changes are primarily due to lighting and shadow detail, and seasonal variations which introduce the effects of snow, moisture content of the soil, and condition of the foliage. Examples of coverage of Big Delta Air Base, Alaska are shown on scene numbers 42, 65, 85, 87, 88, 89, 109, 117, 121, 148, 153, 165, and 194; of Brandenburg Industriehafen A/F, Brandenburg, Germany on scene numbers 505, 524, 525, 526, 527, 528, and 529; and of Doberitz A/F, Doberitz, Germany on scene numbers 535, 536, 537, 538, 539, 540, 541, 542, and 543.

Although examples of deception are particularly interesting they are difficult to find. Camouflage, of the World War II variety, is shown on scenes 206, 207, 208, and 210.

The spectral response characteristics of the television tubes are very similar to panchromatic film, however infrared sensitive tubes are under development. Scene numbers 51 (Pan) and 52 (IR) show varying foliage contrasts due to viewing with light from different parts of the spectrum.

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III. THE TELEVISION EQUIPMENT

Of special interest was the comparison of different television cameras. Since the reconnaissance system would not be engineered for some time, it was desirable to reflect a change in the state of the art with regard to pick-up tubes. Hence certain experimental tubes were tested as well as commercially available ones and all were operated with a video bandwidth of over 8 megacycles.

1-INCH VIDICON CAMERA

The RCA-6198 vidicon tube was operated in an experimental camera chain. The system employed 500-line, 30-frame sequential scanning with a video bandwidth of approximately 9 megacycles. The horizontal blanking period was 15 per cent and the vertical blanking period was 20 per cent; thus there were approximately 400 active scanning lines. The scanned area of the target was 0.5 by 0.375 inches. The scene highlight brightness was 1000-foot lamberts when using a Bausch and Lomb f3.5, 75 mm lens, and the brightness was 630-foot lamberts when using a Wollensak f1.5, 1-inch focal length lens. Both lenses were used at maximum aperture.

2-INCH VIDICON CAMERA

The 2-inch vidicon, which is an RCA experimental tube, was used with the same camera equipment as the 3-inch image orthicon with the addition of a video preamplifier needed for the lower signal level characteristic of the vidicon. The scanning standards were the same as those used in the 3-inch image orthicon tests. The optical image size on the target was 1.12 by 0.84 inches. The scene highlight brightness was 800-foot lamberts with the Ektars set at f3.8.

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The recording of these pictures was accomplished with an Eastman 4 x 5 inch view camera photographing a 16-inch high definition monitor. The film used was Eastman Tri-X and the exposure was 1/5 second at f7.7. The highlight scene brightness of the kinescope was 31.6-foot lamberts. The film was processed in Kodak Developer DK-60A for 5½ minutes at 70°F.

3-INCH IMAGE ORTHICON CAMERA

An RCA-5826 pick-up tube was installed in an RCA TK-11A Studio Camera Chain. Modifications were made to provide 525-line, 30-frame sequential scanning, and the video bandwidth was increased to 10 megacycles. The horizontal blanking period was 18 per cent and the vertical blanking period was 4 per cent; hence there were approximately 500 active scanning lines per frame. The optical image size on the photo-cathode corresponding to the scanning area on the target of the image orthicon was 1.28 by 0.96 inches. The scene highlight brightness was 31-foot lamberts when using the 135 mm and 50 mm focal length Eastman Ektar lenses stopped down to f5.6.

4½-INCH IMAGE ORTHICON CAMERA

The 4½-inch image orthicon is an experimental tube developed by Otto Schade and operated by him at RCA, Harrison, New Jersey. The camera chain used in this case provided 637-line, 30-frame sequential scanning, and the video bandwidth was 16 megacycles. The optical image size on the photo-cathode was 1.7 by 1.285 inches. The photographic recording was made on 4 x 5 inch cut film.

The following table of illustrations tabulates the scene number, sortie number, exposure number, and original photo scale. The scene

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number is our code for quick identification. The sortie and exposure numbers are the Air Force codes for the pictures. The photo scale is obtained by dividing the airplane altitude by the camera focal length. The asterisk symbol (*) appearing in conjunction with a stated photo scale means that the photograph is an oblique photo from a standard 6-inch tri-metrogon camera installation. The stated scale number is that of the corresponding vertical photograph. This number, plus the fact that the oblique cameras of the tri-metrogons are installed with the optical axis depressed 30° from the horizontal should enable more or less ready calculation of X and Y scales at any point in the oblique. As a useful example, these numbers at the principal point of the oblique photos (on axis) are: X scale number = 2 times vertical scale number; Y scale number = 4 times vertical number.

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-7-ILLUSTRATIONS

Scene Number	Sortie	Exposure Number	Original Photo Scale	Page Numbers			
				1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth.
1	EPF-M2-AMC		1:86,000*	26	80	92	151
2	EPF-M2-AMC		1:86,000	26	80	92	
3	EPF-M2-AMC	VT 60	1:86,000	26	80	92	
4	EPF-M2-AMC	VT 64	1:86,000	26	80	92	151
5	EPF-M2-AMC	VT 63	1:86,000	27	81	93	
6	5RT R3136	VT 19	1:80,000	27	81	93	151
7	EPF-M2-AMC	VT 194	1:80,000	27	81	93	151
8	EPF-M2-AMC	VT 99	1:80,000	27	81	93	
9	AJ-M109	VV 15996	1:72,000	28	82	94	
10	HU-M9	VV 549	1:72,000	28	82	94	
11	AJ-M65	VV 9139	1:72,000	28	82	94	
12	AJ-M23	VV 3084	1:72,000	28	82	94	152
13	28 RT R516	VT 35	1:70,000	29	83	95	
14	28 RT R516	VT 35	1:70,000*	29	83	95	
15	28 RT R1084	VT 24	1:70,000	29	83	95	152
16	2AF TM2	LT 16	1:64,000*	29	83	95	
17	5 RT R5024	LT 19	1:64,000*	30	84	96	
18	5 RT R5024	VT 57	1:64,000	30	84	96	152
19	3PR 5M99	V 36		30	84	96	
20	5 RT R3019	VT 10	1:60,000	30	84	96	
21	5 RT R3019	RT 12	1:60,000*	31	85	97	
22	5 RT R3019	LT 1	1:60,000*	31		97	
23	91RTS-R332	LT 102	1:56,000*	31	85	97	153

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Scene Number	Sortie	Exposure Number	Original Photo Scale	Page Numbers			
				1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth.
24	72 PL-8M108	LT 434	1:56,000*	31	85	97	
25	91RTS-R338	VT 90	1:56,000	32	85	98	
26	72 PL-8M108	RT 486	1:56,000*	32	86	98	
27	46RS GM42	RU 3	1:56,000*	32	86	98	
28	5RT-R5L20	VT 2	1:50,000	32	86	98	153
29	GX 2098	SD 143	1:50,000	33		99	
30	40 BG 4MR12	55	1:3600	33	86	99	
31	40 BG 4MB137	23	1:5000	33	87	99	
32	311RW-M1080	V 1	1:30,000	33		99	153
33	311RW-M1080	V 4	1:30,000	34	87	100	
34	302TRS-M553	V 188	1:26,000	34	87	100	
35	302TRS-M553	V 43	1:26,000	34	87	100	
36	14(E19)	V 42	1:25,000	34	88	100	153
37	302TRS-M553	V 257	1:25,000	35	88	101	
38	302TRS-M553	V 516	1:25,000	35	88	101	154
39	302TRS-M553	V 259	1:25,000	35	88	101	
40	302TRS-M553	V 261	1:25,000	35	89	101	
41	302TRS-M553	V 264	1:25,000	36	89	102	
42	72PL-8M151	VV 58	1:37,500	36	89	102	
43	5M370-6	V 10	1:20,000	36	89	102	
44	311RW-M212	V 41	1:20,000	36	90	102	
45	18(E26)	V 26	1:20,000	37	90		154
46	7PTU-9M18	RT 286	1:43,000*	37	90	103	
47	853-154C	VV 52	1:10,000	37	90		

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Scene Number	Sortie	Exposure Number	Original Photo Scale	1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth.
48	S53-154C	VV 14	1:10,000	37,38	91	103	
49	S53-13C	VV 18	1:10,000	38			
50	72PL-8M108	RT 358	1:10,000*	38	91	103	
51	FCT-AMC	59 L	1:1,250	39		103	
52	FCT-AMC	59 K	1:1,250	39	91	104	
53	16PS-5M207A M208	VV 52	1:20,000	39			
54	16PS-5M207A M208	VV 53	1:20,000	39,40			
55	16PS-5M207A M211	VV 81	1:20,000	39,40			154
56	16PS-5M207A M211	VV 80	1:20,000	39,40			
57	16PS-5M207A M208	VV 31	1:20,000	40		104	
58	72PL-8M206	VT 196	1:20,000	41			
59	72PL-8M226	VT 144	1:20,000	41			
60	7PTU 9M18	RT 33	1:20,000*	41			
61	S53-261	VV 17	1:20,000	38,41		104	
62	16P5-5M207A M214	VV 72	1:20,000	42			
63	5M379-6	7	1:20,000	42			
64	Minneapolis- St. Paul	V 63	1:20,000	42		104,105	
65	72PL-8M247 28	VV 190	1:28,000	43		105	
66	72PL-GS6C 8M239	LT 106	1:20,000	43		105	
67	5M379-7	V 8	1:20,000	43			

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Scene Number	Sortie	Exposure Number	Original Photo Scale	1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth.
69	16PS-5M207A M214	VV 141		43			
70	16PS-5M207A M214	VV 81		42			
71	16PS-5M207A M210	VV 30	1:20,000	44		105	
77	Minneapolis- St. Paul	V 150	1:20,000	43			
78	12PT M-1 5M186	V 31	1:20,000			105	
79	72PL-8M108	RT 545	1:20,000*			105	
80	72PL-8M108	RT 546	1:20,000*			105	
83	12PT-5M186 M-10	RT 1731	1:20,000*	44		10	105
84	72RS 28A 8M247A	VV 10	1:20,000	44			106
85	72RS 28A 8M247A	VV 7	1:20,000	44			106
86	7PTU 9M18 34 A	VT 111	1:18,000	45			106
87	72PL-28 8M247	VV 191	1:28,000	45			106
88	46PL 6A 6M112	VT 6	1:28,000	45			105
89	72PL 28A 8M247A	VV 5	1:20,000	45			106
90	GX 202	019	1:20,000	46			106
91	46PL 6M42 6 A	RT 212	1:20,000*	46			
92	GX 5025	SK 431	1:20,000	46			106
93	GX 561	SG 113	1:20,000	47			106
94	GX 561	SG 116	1:20,000	47			106

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Scene Number	Sortie	Exposure Number	Original Photo Scale	1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth.
95	GX 744	SK 016	1:20,000	47		104	
96	GX 1017	SG 057	1:20,000	47			
97	GX 1490	SG 016	1:20,000	48		104	
98	GX 1924	SD 727	1:20,000	48		106	
99	302TRS-M553	VV 560	1:25,000	48			
100	302TRS-M553 S-243	VV 100	1:25,000	48			
101	302TRS-M553 S-243	VV 373	1:25,000	49			
102	302TRS-M553 S-243	VV 601	1:25,000	49			
103	302TRS-M553 S-243	VV 533	1:25,000	49			
104	302TRS-M553 S-243	VV 556	1:25,000	49			
105	302TRS-M553 S-243	VV 558	1:25,000	50			
106	302TRS-M553 S-243	VV 567	1:25,000	50			
107	302TRS-M553 S-243	VV 384	1:25,000	50			
108	72PL-8M247	VV 7	1:39,000	50,51			
109	72PL-8M68A	VV 51	1:38,000	51			
110	302TRS-M553 S-243	VV 360	1:25,000	51			
111	302TRS-M553 S-243	VV 321	1:25,000	52			
112	91RS R11-H-1	VV 142	1:38,000	51,52			
113	72PL-9M14 34B	RT 123	*	51,52			

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Scene Number	Sortie	Exposure Number	Original Photo Scale	1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth.
114	302TRS-M553 S-241	VV 335	1:25,000	52			
115	72PL-9M14 34B	LT 49		*	51,53		
116	302TRS M553 S-24	VV 379	1:25,000	53			
117	72PL-8M247 28	VV 116	1:39,000	53			
118	302TRS-M553 S-243	VV 501	1:25,000	54			
119	302TRS-M553 S-243	VV 500	1:25,000	54			
120	302TRS-M553 S-241	VV 28	1:25,000	53,54			
121	72PL-8M151A 28 A	VV 59	1:38,000	54		105	
122	302TRS-M553 S-243	VV 106	1:25,000	55			
123	302TRS-M553 S-241	VV 53	1:25,000	51,55			
124	302TRS-M553 S-241	VV 399	1:25,000	53,55			
125	302TRS-M553 S-241	VV 396	1:25,000	55			
126	302TRS-M553 S-243	VV 417	1:25,000	51,56			
127	302TRS-M553 S-241	VV 298	1:25,000	51,56			
128	302TRS-M553 S-243	VV 495	1:25,000	53,56			
129	302TRS-M553 S-241	VV 181	1:25,000	56			
130	302TRS-M553 S-241	VV 173	1:25,000	57			

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Scene Number	Sortie	Exposure Number	Original Photo Scale	1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth.
131	302TRS-M553 S-241	VV 175	1:25,000	57			
132	302TRS-M553 S-241	VV 199	1:25,000	57			
133	302TRS-M553 S-241	VV 202	1:25,000	57			
134	16PS-M207 5M207A	VV 38	1:20,000	58			104
135	16PS-M207 5M207A	VV 36	1:20,000	58			
137	16PS-M208 5M207A	VV 109	1:20,000	58			
139	72PL-28 8M247A	VV 12	1:20,000				105
140	16PS-M212 5M207A	VV 10	1:20,000	59			
141	16PS-M211 5M207A	VV 24	1:20,000	59			
142	16PS-M211 5M207A	VV 20	1:20,000	59			
143	16PS-M208 5M207A	VV 112	1:20,000	59			
144	Minneapolis- St. Paul	V 15	1:20,000	60			
145	17(E24)	V 4	1:20,000	60			
146	17(E25)	V 7	1:20,000	60			
147	2(E22)	V 20	1:20,000	60			107
148	72PL-28 8M64A	VV 5	1:19,000	61			106
149	72PL-34B 9M14	RT 86	1:20,000*	61			107

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Scene Number	Sortie	Exposure Number	Original Photo Scale	1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth.
149a	46PL-21A 7M186	VV 57	1:20,000	46,61			
150	GX 2363	SD 026	1:20,000	61			
151	GX 2363	SD 027	1:20,000	62		107	
152	GX 2363	SD 028	1:20,000	62			
153	BIG-2	V-35	1:25,000	62		106	
154	GX 2363	SD 030	1:20,000	62		107	
155	GX 2363	SD 029	1:20,000	63			
156	GX 561	SD 105	1:20,000	63		107	
157	GX 759	SD 015	1:10,000	63		107	
158	GX 1445	SD 012	1:10,000	63		107	
161	16PS-M211 5M207A	VV 56	1:20,000	64		104	
162	72PL-8M107	LT 365	1:20,000	64		106	
163	GX 1490	SG 070	1:20,000	64		106	
164	19(E27)	V 14	1:20,000	46,64			
165	7PTU-9M18 34A	VT 114	1:18,000	65		105	
166	16(E20)	V 12	1:20,000	65		106	
167	5M379-7	V 13	1:20,000	46,65			
168	5M379-5	V 12	1:20,000	65			
169	5M379-5	V 10	1:20,000	66			
170	5M379-5	V 6	1:20,000	66		105	
171	16PS-M208 5M207A	VV 96	1:20,000	66			
172	16PS-M212 5M207A	VV 46	1:20,000	66			

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Scene Number	Sortie	Exposure Number	Original Photo Scale	1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth
173	16PS-M212 5M207A	VV 44	1:20,000	67			
174	16PS-M214 5M207A	VV 17	1:20,000	67			
175	16PS-M214 5M207A	VV 74	1:20,000	43,67			
176	16PS-M208 5M207A	VV 37	1:20,000	67			105
177	5M379-3	V 23	1:20,000	68			107
178	5M379-7	V 12	1:20,000	68			
179	17(E25)	V 8	1:20,000	68			
180	18(E26)	V 28	1:20,000	68			107
181	19(E28)	V 33	1:20,000	69			107
182	19(E29)	V 18	1:20,000	69			107
183	24(E42)	V 16	1:20,000	69			104
184	16(E21)	V 56	1:20,000	42,69			
185	11(E16)	V 60	1:20,000	70			
186	11(E16)	V 58	1:20,000	70			
187	16(E20)	V 9	1:20,000	70			
188	10(E16)	V 13	1:20,000	42,70			
189	10(E16)	V 11	1:20,000	71			
190	72PL-8M107 0001	RT 437	1:25,000*	71			107
191	12PT M-3 5M186	RT 462	1:25,000*	71			
192	12PT M-7 5M186	RT 1070	1:25,000*	71			
193	72PL-28A 8M151A	VV 73	1:28,000	72			107

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Scene Number	Sortie	Exposure Number	Original Photo Scale	1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth.
194	72PL-28A 8M151A	VV71	1:28,000	72		105	
195	GX 1924	SD 729		72		107	
196	46PL-6M124 6B	LT 35		*	72		107
197	72PL-8M108 000I	LT 267		*	73		107
198	GX 4200	SD 74		73			
199	GX 4200	SD 77		73			
200	GX 4200	SD 79		73			
201	GX 5042	SG 025	1:20,000	74			
202	GX 536	SD 310	1:20,000	74		106	
203	GX 732	SD 049	1:20,000	74			
204	GX 841	SG 016	1:20,000	74			
205	16PS-M211 5M207A	VV 51	1:20,000	75			
206	16PS-M211 5M207A	VV 53	1:20,000	75			
207	16PS-M211 5M207A	VV 52	1:20,000	75			
208	16PS-M214 5M207A	VV 7	1:20,000	58,76	99		
209	16PS-M214 5M207A	VV 8	1:20,000	58,76			
210	16PS-M214 5M207A	VV 6	1:20,000	58,76			
211	16PS-M213 5M207A	VV 7	1:20,000	75,76			
212	16PS-M213 5M207A	VV 6	1:20,000	75,77			

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Scene Number	Sortie	Exposure Number	Original Photo Scale	1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth.
213	EXF-R-MC B	VT 5	1:80,000	77			108
214	EXF-R-MC B	VT 4	1:80,000	77			108
215	EXF-R-MC B	VT 22	1:80,000				108
216	EXF-R-MC B	VT 21	1:80,000	77			108
240	S53-44	VV 18	1:10,000				109
241	S53-154C	VV 53	1:10,000	78			
248	S-1054C	VT 11			37,78		
249	S-1054C	VT 12			37,78		
250	S-53-13C	VV 19	1:10,000	38			
251	46PL-7M44 15B	VT 23	1:20,000	38			104
275	72PL-8M48 00U	VV 420	1:20,000	78			
282	FCT-MCREXF AMC	K-41	1:12,500	79			
290	M2-R109	LT 5	1:86,000*				109
291	M2-R109	RT 1	1:86,000*				109
292	M2-R109	RT 4	1:86,000*				109
293	M2-R109	RT 63	1:86,000*				110
294	12RS-M885 PR38	VV 26	1:80,000				110
295	AJ-M123	17660	1:80,000				110
296	EXP-R-MC	VT 2	1:80,000				110
297	EXP-R-MC	VT 76	1:80,000				111
298	EXP-R-MC	VT 97	1:80,000				111

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Page Numbers

Scene Number	Sortie	Exposure Number	Original Photo Scale	1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth.
299	EXP-R-MC	VT 111	1:80,000			111	
300	EXP-R-MC	VT 112	1:80,000			111	
301	EXP-R-MC B	VT 118	1:80,000			112	
302	EXF-R-MC B	VT 138	1:80,000			112	
303	EXF-R-MC B	VT 139	1:80,000			112	
304	EXF-R-MC B	VT 1	1:80,000			112	
305	EXF-R-MC B	RT 12	1:80,000*			113	
306	EXF-R-MC B	LT 37	1:80,000*			113	
307	EXF-R-MC B	RT 37	1:80,000*			113	
308	EXF-R-MC A	VT 125	1:80,000			113	
309	EXF-R-MC A	VT 198	1:80,000			114	
310	EXF-R-MC A	VT 197	1:80,000			114	
311	EXF-R-MC	LT 198	1:80,000*			114	
312	EXF-R-MC A	VT 314	1:80,000			114	
313	EXP-R-MC A	VT 339	1:80,000			115	
314	EXP-R-MC B	VT 75	1:80,000			115	
315	EXF-R-MC B	VT 98	1:80,000			115	

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Scene Number	Sortie	Exposure Number	Original Photo Scale	1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth.
316	EXF-R-MC B	VT 118	1:80,000				115
317	5RT R 3136	VT 12	1:80,000				116
318	EXF-R-MC B	VT 117	1:80,000				116
319	EXF-R-MC B	VT 90	1:80,000				116
320	EXF-R-MC	LT 38	1:80,000*				116
321	EXF-R-MC A	VT 146	1:80,000				117
322	EXF-R-MC A	VT 12	1:80,000				117
323	EXF-R-MC	RT 12	1:80,000*				117
324	EXF-R-MC A	VT 11	1:80,000				117
325	EXF-R-MC	LT 12	1:80,000*				118
326	EXF-R-MC	RT 182	1:80,000*				118
327	EXF-R-MC	RT 183	1:80,000*				118
328	EXF-R-MC	RT 195	1:80,000*				118
329	EXF-R-MC	RT 196	1:80,000*				119
330	EXF-R-MC	VT 16	1:80,000				119
331	EXF-R-MC	VT 39	1:80,000				119
332	EXF-R-MC	VT 41	1:80,000				119
333	EXF-R-MC	VT 114	1:80,000				120
334	EXF-R-MC	RT 195	1:80,000*				120
335	5RT-R3136	RT 14	1:80,000*				120
336	EXF-R-MC A	VT 199	1:80,000				120

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Page Numbers

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Scene Number	Sortie	Exposure Number	Original Photo Scale	1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth.
337	EXF-R-MC A	VT 38	1:80,000			121	
338	12RS M889 12 AF	VV 23	1:80,000			121	
339	12RS M844 12 AF	VV 23	1:80,000			121	
340	12RS M889 12 AF	VV 27	1:80,000			121	
341	12RS M891 12 AF	VV 9	1:80,000			122	
342	12RS M873 12 AF	VV 8	1:80,000			122	
343	12RS M873 12 AF	VV 24	1:80,000			122	
344	12RS M873 12 AF	VV 22	1:80,000			122	
345	12RS M873 12 AF	VV 39	1:80,000			123	
346	EXF-R-MC A	VT 15	1:80,000			123	
347	EXF-R-MC	LT 190	1:80,000*			123	
348	EXF-R-MC A	VT 36	1:80,000			123	
349	EXF-R-MC A	VT 348	1:80,000			124	
350	5 RT R3030	LT 12	1:72,000*			124	
351	5 RT R3030	RT 16	1:72,000*			124	
352	AJ-M104	15550	1:72,000			124	
353	AJ-M114	16575	1:72,000			125	

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Scene Number	Sortie	Exposure Number	Original Photo Scale	1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth.
354	AJ-M114	16591	1:72,000			125	
355	AJ-M104	15548	1:72,000			125	
356	AJ-M114	16577	1:72,000			125	
357	AJ-M105	15582	1:72,000			126	
358	HU-M9	529	1:72,000			126	
359	HU-M8	397	1:72,000			126	
360	AJ-M119	17239	1:72,000			126	
361	AJ-M119	17241	1:72,000			127	
362	AJ-M105	17580	1:72,000			127	
363	HU-23	2221	1:72,000			127	
364	HU-30	2978	1:72,000			127	
365	5RT R3030	VV 6	1:72,000			128	
366	5RT R3030	LT 16	1:72,000*			128	
367	5RT R3030	VV 17	1:72,000			128	
368	3PR-5M99 21BC-DA/9	V 34	1:10,200			128	
369	N/40BG 4MR52 12-26-44 DA/4	V 16	1:13,740			129	
370	5 RT R5024	VT 160	1:64,000			129	
371	5 RT R5024	VT 59	1:64,000			129	
372	5 RT R5024	VT 61	1:64,000			129	
373	4203 PTS R-1 2AF-TM2	VT 16	1:64,000			130	

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Scene Number	Sortie	Exposure Number	Original Photo Scale	1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth.
374	5 RT R5024	LT 18	1:64,000*			130	
375	3PR-5M99 21BC DA/9	V 35	1:10,200			130	
377	5 RT R5024	VT 100	1:64,000			130	
378	5. RT R5024	VT 157	1:64,000			131	
379	4203PTS R-1 2AF TM2	VT 19	1:64,000			131	
380	5 RT R5024	VT 22	1:64,000			131	
381	5 RT R5024	LT 20	1:64,000*			131	
382	3PR 4M39 3L DA/3	V 26	1:64,000			132	
383	3PR 4M39 3L DA/3	V 24	1:64,000			132	
384	3PR 4M39 3L DA/3	V 25	1:64,000			132	
385	5 RT R5024	LT 102	1:64,000*			132	
386	5 RT R3019	LT 2	1:60,000*			133	
387	5 RT R3019	VT 9	1:60,000			133	
388	5 RT R3019	LT 6	1:60,000*			133	
389	5 RT R3019	VT 7	1:60,000			133	
390	5 RT R3019	VT 6	1:60,000			134	
391	5 RT R3019	VT 5	1:60,000			134	

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Scene Number	Sortie	Exposure Number	Original Photo Scale	Page Numbers			
				1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth.
392	5 RT R3019	RT 11	1:60,000*				134
393	5 RT R3019	RT 10	1:60,000*				134
394	5 RT R3019	RT 13	1:60,000*				135
395	GX 1128	SK 39	1:56,000				135
396	7PTU 9M18 34C	RT 640	1:56,000*				135
397	46PL 6M124	RT 17	1:56,000*				135
398	46PL 6M45 6B	LT 447	1:56,000*				136
399	91RTS R338	VTM 92	1:56,000				136
400	GX 1182	SK 83	1:56,000				136
401	7PTU-9M18 34 F	RT 298	1:56,000*				136
402	46PL-6M13 1A	LO 31	1:56,000*				137
403	72PL-8M108 000I	RT 590	1:56,000*				137
404	91RTS R338	LTM 91	1:56,000*				137
405	91RTS R338	LTM 100	1:56,000*				137
406	7PTU-9M18 34F	RT 419	1:56,000*				138
407	46PL-6M13 1A	LO 42	1:56,000*				138
408	47-43-11A 3-150R	RO 116	1:56,000*				138
409	7PTU-9M18 34A	LT 20	1:56,000*				138

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Page Numbers

Scene Number	Sortie	Exposure Number	Original Photo Scale	1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth.	↑
410	3PR 4M17	V 3	1:56,000				139	
412	5 RT R2317	VT 3	1:50,000				139	
413	GX 1153	SD 108	1:50,000				139	
414	72PL-8M151A 28A	VV 71	1:28,000				105	
505	S53-13C	VV 18	1:9,000				139	
508	S53-234C	VV 49	1:10,000				140	
509	S53-161C	VV 11	1:16,000				140	
510	S53-145C	VV 11	1:10,000				140	
511	S53-145C	VV 11	1:10,000				140	
512	S53-216C	VV 21	1:10,000				141	
513	S53-216C	VV 21	1:10,000				141	
514	S53-216C	VV 22	1:10,000				141	
515	S53-216C	VV 22	1:10,000				141	
516	S53-151C	VV 22	1:14,000				142	
517	S53-151C	VV 23	1:14,000				142	
518	S53-160C	VV 6	1:10,000				142	
519	S53-160C	VV 77	1:10,000				142	
520	S53-161C	VV 3	1:16,000				143	
521	S53-162C	VV 6	1:11,000				143	
522	S53-160C	VV 1	1:10,000				143	
523	S53-160C	VV 2	1:10,000				143	
524	S53-13C	VV 19	1:9,000				144	
525	S53-S1054C	VV 16					144	

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Scene Number	Sortie	Exposure Number	Original Photo Scale	1 Inch Vidicon	2 Inch Vidicon	3 Inch Im.Orth.	4½ Inch Im.Orth.
526	S53-167C	VV 29	1:9,000			144	
527	S53-167C	VV 31	1:9,000			144	
528	S53-234C	VV 102	1:10,400			145	
529	S53-234C	VV 104	1:10,400			145	
530	S53-234C	VV 29	1:10,000			145	
531	S53-234C	VV 29	1:10,000			145	
532	S53-234C	VV 32	1:10,000			146	
533	S53-234C	VV 32	1:10,000			146	
534	S53-234C	VV 30	1:10,000			146	
535	S53-234C	VV 88	1:10,400			146	
536	S53-234C	VV 88	1:10,400			147	
537	S53-178C	VV 9	1:10,000			147	
538	S53-160C	VV 16	1:10,000			147	
539	S53-160C	VV 17	1:10,000			147	
540	S53-44C	VV 22	1:10,000			148	
541	S53-154C	VV 10	1:11,000			148	
542	S53-145C	VV 21	1:13,000			148	
543	S53-151C	VV 30	1:9,000			148	
544	S53-160C	VV 20	1:10,000			149	
545	S53-160C	VV 22	1:10,000			149	
546	S53-151C	VV 34	1:9,000			149	
547	S53-151C	VV 35	1:9,000			149	
548	S53-154C	VV 14	1:11,000			150	
549	S53-13C	VV 1	1:10,000			150	
550	S53-13C	VV 2	1:10,000			150	

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1

Scale on Photoactive Element
1:2,092,000*

2

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1:2,092,000

3

Scale on Photoactive Element
1:2,092,000

4

Scale on Photoactive Element
1:2,092,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

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5

Scale on Photoactive Element
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6

Scale on Photoactive Element
1:1,946,000

7

Scale on Photoactive Element
1:1,946,000

8

Scale on Photoactive Element
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1" VIDICON

CONFIDENTIAL

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RM-1555
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9

Scale on Photoactive Element
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10

Scale on Photoactive Element
1:1,751,000

11

Scale on Photoactive Element
1:1,751,000

12

Scale on Photoactive Element
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1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
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-29-

13

Scale on Photoactive Element
1:1,703,000

14

Scale on Photoactive Element
1:1,703,000

15

Scale on Photoactive Element
1:1,703,000

16

Scale on Photoactive Element
1:1,557,000*

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
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-30-

17

Scale on Photoactive Element
1:1,557,000*

18

Scale on Photoactive Element
1:1,557,000

19

20

Scale on Photoactive Element
1:1,460,000

1" VIDICON

CONFIDENTIAL

RM-1555
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CONFIDENTIAL

21

Scale on Photoactive Element
1:1,460,000*

22

Scale on Photoactive Element
1:1,460,000*

23

Scale on Photoactive Element
1:1,362,000*

24

Scale on Photoactive Element
1:1,362,000*

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
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25

Scale on Photoactive Element
1:1,362,000

26

Scale on Photoactive Element
1:1,362,000*

27

Scale on Photoactive Element
1:1,362,000*

28

Scale on Photoactive Element
1:1,216,000

1" VIDICON

CONFIDENTIAL

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CONFIDENTIAL

29

Scale on Photoactive Element
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30

Scale on Photoactive Element
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31

Scale on Photoactive Element
1:122,000

32

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1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
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33

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1:730,000

34

Scale on Photoactive Element
1:632,000

35

Scale on Photoactive Element
1:632,000

36

Scale on Photoactive Element
1:608,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
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37

Scale on Photoactive Element
1:608,000

38

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39

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40

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1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
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41

Scale on Photoactive Element
1:608,000

42

Scale on Photoactive Element
1:912,000

43

Scale on Photoactive Element
1:486,000

44

Scale on Photoactive Element
L;486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
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45

Scale on Photoactive Element
1:486,000

46

Scale on Photoactive Element
1:1,046,000*

47

Scale on Photoactive Element
1:243,000

47, 48, 248, 249

1" VIDICON

CONFIDENTIAL

RM-1555
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CONFIDENTIAL

48

Scale on Photoactive Element
1:243,000

49

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1:243,000

49, 61, 250, 251

50

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1:243,000*

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
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51

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1:30,000

52

Scale on Photoactive Element
1:30,000

53

Scale on Photoactive Element
1:486,000

53, 54, 55, 56

1st VIDICON

CONFIDENTIAL

RM-1555
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CONFIDENTIAL

54

Scale on Photoactive Element
1:486,000

55

Scale on Photoactive Element
1:486,000

56

Scale on Photoactive Element
1:486,000

57

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
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58

Scale on Photoactive Element
1:486,000

59

Scale on Photoactive Element
1:486,000

60

Scale on Photoactive Element
1:486,000*

61

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-42-

62

62, 70, 184, 188

Scale on Photoactive Element
1:486,000

63

Scale on Photoactive Element
1:486,000

64

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
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65

Scale on Photoactive Element
1:681,000

66

Scale on Photoactive Element
1:486,000*

67

67, 69, 77, 175

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
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71

Scale on Photoactive Element
1:486,000

83

Scale on Photoactive Element
1:486,000*

84

Scale on Photoactive Element
1:486,000

85

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

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CONFIDENTIAL

86

Scale on Photoactive Element
1:438,000

87

Scale on Photoactive Element
1:681,000

88

Scale on Photoactive Element
1:681,000

89

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
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90

Scale on Photoactive Element
1:486,000

91

Scale on Photoactive Element
1:486,000*

91, 149a, 164, 167

92

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
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93

Scale on Photoactive Element
1:486,000

94

Scale on Photoactive Element
1:486,000

95

Scale on Photoactive Element
1:486,000

96

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-48-

97

Scale on Photoactive Element
1:486,000

98

Scale on Photoactive Element
1:486,000

99

Scale on Photoactive Element
1:608,000

100

Scale on Photoactive Element
1:608,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
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101

Scale on Photoactive Element
1:608,000

102

Scale on Photoactive Element
1:608,000

103

Scale on Photoactive Element
1:608,000

104

Scale on Photoactive Element
1:608,000

1" VIDICON

CONFIDENTIAL

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105

Scale on Photoactive Element
1:608,000

106

Scale on Photoactive Element
1:608,000

107

Scale on Photoactive Element
1:608,000

108

Scale on Photoactive Element
1:949,000

1" VIDICON

CONFIDENTIAL

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108, 123, 126, 127

109

Scale on Photoactive Element
1:924,000

109, 112, 113, 115

110

Scale on Photoactive Element
1:608,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-52-

111

Scale on Photoactive Element
1:608,000

112

Scale on Photoactive Element
1:924,000

113

114

Scale on Photoactive Element
1:608,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-53-

115

116

Scale on Photoactive Element
1:608,000

117

117, 120, 124, 128

Scale on Photoactive Element
1:949,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
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118

Scale on Photoactive Element
1:608,000

119

Scale on Photoactive Element
1:608,000

120

Scale on Photoactive Element
1:608,000

121

Scale on Photoactive Element
1:924,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
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122

Scale on Photoactive Element
1:608,000

123

Scale on Photoactive Element
1:608,000

124

Scale on Photoactive Element
1:608,000

125

Scale on Photoactive Element
1:608,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
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126

Scale on Photoactive Element
1:608,000

127

Scale on Photoactive Element
1:608,000

128

Scale on Photoactive Element
1:608,000

129

Scale on Photoactive Element
1:608,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

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130

Scale on Photoactive Element
1:608,000

131

Scale on Photoactive Element
1:608,000

132

Scale on Photoactive Element
1:608,000

133

Scale on Photoactive Element
1:608,000

1" VIDICON

CONFIDENTIAL

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134

Scale on Photoactive Element
1:486,000

135

Scale on Photoactive Element
1:486,000

137

Scale on Photoactive Element
1:486,000

137, 208, 209, 210

1" VIDICON

CONFIDENTIAL

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140

Scale on Photoactive Element
1:486,000

141

Scale on Photoactive Element
1:486,000

142

Scale on Photoactive Element
1:486,000

143

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

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144

Scale on Photoactive Element
1:486,000

145

Scale on Photoactive Element
1:486,000

146

Scale on Photoactive Element
1:486,000

147

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-61-

148

Scale on Photoactive Element
1:462,000

149

Scale on Photoactive Element
1:486,000*

149a

Scale on Photoactive Element
1:486,000

150

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-62-

151

Scale on Photoactive Element
1:486,000

152

Scale on Photoactive Element
1:486,000

153

Scale on Photoactive Element
1:608,000

154

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-63-

155

Scale on Photoactive Element
1:486,000

156

Scale on Photoactive Element
1:486,000

157

Scale on Photoactive Element
1:243,000

158

Scale on Photoactive Element
1:243,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-64-

161

Scale on Photoactive Element
1:486,000

162

Scale on Photoactive Element
1:486,000*

163

Scale on Photoactive Element
1:486,000

164

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

RM-1555
9-16-55
-65-

CONFIDENTIAL

165

Scale on Photoactive Element
1:438,000

166

Scale on Photoactive Element
1:486,000

167

Scale on Photoactive Element
1:486,000

168

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-66-

169

Scale on Photoactive Element
1:486,000

170

Scale on Photoactive Element
1:486,000

171

Scale on Photoactive Element
1:486,000

172

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-67-

173

Scale on Photoactive Element
1:486,000

174

Scale on Photoactive Element
1:486,000

175

Scale on Photoactive Element
1:486,000

176

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-68-

177

Scale on Photoactive Element
1:486,000

178

Scale on Photoactive Element
1:486,000

179

Scale on Photoactive Element
1:486,000

180

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-69-

181

Scale on Photoactive Element
1:486,000

182

Scale on Photoactive Element
1:486,000

183

Scale on Photoactive Element
1:486,000

184

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-70-

185

Scale on Photoactive Element
1:486,000

186

Scale on Photoactive Element
1:486,000

187

Scale on Photoactive Element
1:486,000

188

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-71-

189

Scale on Photoactive Element
1:486,000

190

Scale on Photoactive Element
1:608,000*

191

Scale on Photoactive Element
1:608,000*

192

Scale on Photoactive Element
1:608,000*

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-72-

193

Scale on Photoactive Element
1:681,000

194

Scale on Photoactive Element
1:681,000

195

196

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-73-

197

198

199

200

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-74-

201

Scale on Photoactive Element
1:486,000

202

Scale on Photoactive Element
1:486,000

203

Scale on Photoactive Element
1:486,000

204

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-75-

205

Scale on Photoactive Element
1:486,000

206

Scale on Photoactive Element
1:486,000

206, 207, 211, 212

207

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

RM-1555
9-16-55
-76-

CONFIDENTIAL

208

Scale on Photoactive Element
1:486,000

209

Scale on Photoactive Element
1:486,000

210

Scale on Photoactive Element
1:486,000

211

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-77-

212

Scale on Photoactive Element
1:486,000

213

Scale on Photoactive Element
1:1,946,000

124

Scale on Photoactive Element
1:1,946,000

216

Scale on Photoactive Element
1:1,946,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-78-

241

248

Scale on Photoactive Element
1:243,000

249

275

Scale on Photoactive Element
1:486,000

1" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-79-

282

Scale on Photoactive Element
1:304,000

CONFIDENTIAL

RM-1555
9-16-55
-80-

CONFIDENTIAL

1

Scale on Photoactive Element
1:1,032,000*

2

Scale on Photoactive Element
1:1,032,000

3

Scale on Photoactive Element
1:1,032,000

4

Scale on Photoactive Element
1:1,032,000

2" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-81-

5

Scale on Photoactive Element
1:1,032,000

6

Scale on Photoactive Element
1:960,000

7

Scale on Photoactive Element
1:960,000

8

Scale on Photoactive Element
1:960,000

2" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-82-

9

Scale on Photoactive Element
1:864,000

10

Scale on Photoactive Element
1:864,000

11

Scale on Photoactive Element
1:864,000

12

Scale on Photoactive Element
1:864,000

2" VIDICON

CONFIDENTIAL

RM-1555
9-16-55
-83-

CONFIDENTIAL

13

Scale on Photoactive Element
1:840,000

14

Scale on Photoactive Element
1:840,000*

15

Scale on Photoactive Element
1:840,000

16

Scale on Photoactive Element
1:768,000*

2" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-84-

17

Scale on Photoactive Element
1:768,000*

18

Scale on Photoactive Element
1:768,000

19

20

Scale on Photoactive Element
1:720,000

2nd VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-85-

21

Scale on Photoactive Element
1:720,000*

23

Scale on Photoactive Element
1:672,000*

24

Scale on Photoactive Element
1:672,000*

25

Scale on Photoactive Element
1:672,000

2" VIDICON

CONFIDENTIAL

CONFIDENTIAL

26

Scale on Photoactive Element
1:672,000*

27

Scale on Photoactive Element
1:672,000*

28

Scale on Photoactive Element
1:600,000

30

Scale on Photoactive Element
1:43,000

2" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-87-

31

Scale on Photoactive Element
1:60,000

33

Scale on Photoactive Element
1:360,000

34

Scale on Photoactive Element
1:312,000

35

Scale on Photoactive Element
1:312,000

2" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-88-

36

Scale on Photoactive Element
1:300,000

37

Scale on Photoactive Element
1:300,000

38

Scale on Photoactive Element
1:300,000

39

Scale on Photoactive Element
1:300,000

2" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-89-

40

Scale on Photoactive Element
1:300,000

41

Scale on Photoactive Element
1:300,000

42

Scale on Photoactive Element
1:450,000

43

Scale on Photoactive Element
1:240,000

2" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-90-

44

Scale on Photoactive Element
1:240,000

45

Scale on Photoactive Element
1:240,000

46

Scale on Photoactive Element
1:516,000*

47

Scale on Photoactive Element
1:120,000

2" VIDICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-91-

48

Scale on Photoactive Element
1:120,000

50

Scale on Photoactive Element
1:120,000*

52

Scale on Photoactive Element
1:15,000

208

Scale on Photoactive Element
1:240,000

2" VIDICON

CONFIDENTIAL

RM-1555
9-16-55
-92-

CONFIDENTIAL

1

Scale on Photoactive Element
1:806,000*

2

Scale on Photoactive Element
1:806,000

3

Scale on Photoactive Element
1:806,000

4

Scale on Photoactive Element
1:806,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-93-

5

Scale on Photoactive Element
1:806,000

6

Scale on Photoactive Element
1:750,000

7

Scale on Photoactive Element
1:750,000

8

Scale on Photoactive Element
1:750,000

3rd IMAGE ORTHICON

CONFIDENTIAL

RM-1555
9-16-55
-94-

CONFIDENTIAL

9

Scale on Photoactive Element
1:675,000

10

Scale on Photoactive Element
1:675,000

11

Scale on Photoactive Element
1:675,000

12

Scale on Photoactive Element
1:675,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-95-

13

Scale on Photoactive Element
1:656,000

14

Scale on Photoactive Element
1:656,000*

15

Scale on Photoactive Element
1:656,000

16

Scale on Photoactive Element
1:600,000*

3* IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-96-

17

Scale on Photoactive Element
1:600,000*

18

Scale on Photoactive Element
1:600,000

19

20

Scale on Photoactive Element
1:563,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-97-

21

Scale on Photoactive Element
1:563,000*

22

Scale on Photoactive Element
1:563,000*

23

Scale on Photoactive Element
1:523,000*

24

Scale on Photoactive Element
1:523,000*

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

25

Scale on Photoactive Element
1:523,000

26

Scale on Photoactive Element
1:523,000*

27

Scale on Photoactive Element
1:523,000*

28

Scale on Photoactive Element
1:469,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-99-

29

Scale on Photoactive Element
1:469,000

30

Scale on Photoactive Element
1:34,000

31

Scale on Photoactive Element
1:47,000

32

Scale on Photoactive Element
1:281,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-100-

33

Scale on Photoactive Element
1:281,000

34

Scale on Photoactive Element
1:244,000

35

Scale on Photoactive Element
1:244,000

36

Scale on Photoactive Element
1:234,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-101-

37

Scale on Photoactive Element
1:234,000

38

Scale on Photoactive Element
1:234,000

39

Scale on Photoactive Element
1:234,000

40

Scale on Photoactive Element
1:234,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-102-

41

Scale on Photoactive Element
1:234,000

42

Scale on Photoactive Element
1:352,000

43

Scale on Photoactive Element
1:188,000

44

Scale on Photoactive Element
1:188,000

3" IMAGE ORTHICON

CONFIDENTIAL

RM-1555
9-16-55
-103-

CONFIDENTIAL

46

Scale on Photoactive Element
1:403,000*

48

Scale on Photoactive Element
1:94,000

50

Scale on Photoactive Element
1:94,000*

51

Scale on Photoactive Element
1:12,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-104-

52

57, 95, 97, 161

Scale on Photoactive Element
1:12,000

61, 134, 183, 251

64

Scale on Photoactive Element
1:188,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

EM-1555
9-16-55
-105-

64, 71, 170, 176

65, 79, 80, 83

66, 88, 121, 414

78, 139, 165, 194

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-106-

84, 85, 86, 87

89, 92, 162, 163

90, 148, 153, 166

93, 94, 98, 202

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-107-

147, 149, 151, 154

156, 157, 158, 195

177, 180, 181, 182

190, 193, 196, 197

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-108-

213

Scale on Photoactive Element
1:750,000

214

Scale on Photoactive Element
1:750,000

215

Scale on Photoactive Element
1:750,000

216

Scale on Photoactive Element
1:750,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-109-

240

Scale on Photoactive Element
1:94,000

290

Scale on Photoactive Element
1:806,000*

291

Scale on Photoactive Element
1:806,000*

292

Scale on Photoactive Element
1:806,000*

3" IMAGE ORTHICON

CONFIDENTIAL

RM-1555
9-16-55
-110-

CONFIDENTIAL

293

Scale on Photoactive Element
1:806,000*

294

Scale on Photoactive Element
1:750,000

295

Scale on Photoactive Element
1:750,000

296

Scale on Photoactive Element
1:750,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-111-

297

Scale on Photoactive Element
1:750,000

298

Scale on Photoactive Element
1:750,000

299

Scale on Photoactive Element
1:750,000

300

Scale on Photoactive Element
1:750,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-112-

301

Scale on Photoactive Element
1:750,000

302

Scale on Photoactive Element
1:750,000

303

Scale on Photoactive Element
1:750,000

304

Scale on Photoactive Element
1:750,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-113-

305

Scale on Photoactive Element
1:750,000*

306

Scale on Photoactive Element
1:750,000*

307

Scale on Photoactive Element
1:750,000*

308

Scale on Photoactive Element
1:750,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-114-

309

Scale on Photoactive Element
1:750,000

310

Scale on Photoactive Element
1:750,000

311

Scale on Photoactive Element
1:750,000*

312

Scale on Photoactive Element
1:750,000

3"IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-115-

313

Scale on Photoactive Element
1:750,000

314

Scale on Photoactive Element
1:750,000

315

Scale on Photoactive Element
1:750,000

316

Scale on Photoactive Element
1:750,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-116-

317

Scale on Photoactive Element
1:750,000

318

Scale on Photoactive Element
1:750,000

319

Scale on Photoactive Element
1:750,000

320

Scale on Photoactive Element
1:750,000*

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-117-

321

Scale on Photoactive Element
1:750,000

322

Scale on Photoactive Element
1:750,000

323

Scale on Photoactive Element
1:750,000*

324

Scale on Photoactive Element
1:750,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-118-

325

Scale on Photoactive Element
1:750,000*

326

Scale on Photoactive Element
1:750,000*

327

Scale on Photoactive Element
1:750,000*

328

Scale on Photoactive Element
1:750,000*

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-119-

329

Scale on Photoactive Element
1:750,000*

330

Scale on Photoactive Element
1:750,000

331

Scale on Photoactive Element
1:750,000

332

Scale on Photoactive Element
1:750,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-120-

333

Scale on Photoactive Element
1:750,000

334

Scale on Photoactive Element
1:750,000*

335

Scale on Photoactive Element
1:750,000*

336

Scale on Photoactive Element
1:750,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-121-

337

Scale on Photoactive Element
1:750,000

338

Scale on Photoactive Element
1:750,000

339

Scale on Photoactive Element
1:750,000

340

Scale on Photoactive Element
1:750,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-122-

341

Scale on Photoactive Element
1:750,000

342

Scale on Photoactive Element
1:750,000

343

Scale on Photoactive Element
1:750,000

344

Scale on Photoactive Element
1:750,000

3" IMAGE ORTHICON

CONFIDENTIAL

RM-1555
9-16-55
-123-

CONFIDENTIAL

345

Scale on Photoactive Element
1:750,000

346

Scale on Photoactive Element
1:750,000

347

Scale on Photoactive Element
1:750,000*

348

Scale on Photoactive Element
1:750,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-124-

349

Scale on Photoactive Element
1:750,000

350

Scale on Photoactive Element
1:675,000*

351

Scale on Photoactive Element
1:675,000*

352

Scale on Photoactive Element
1:675,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-125-

353

Scale on Photoactive Element
1:675,000

354

Scale on Photoactive Element
1:675,000

355

Scale on Photoactive Element
1:675,000

356

Scale on Photoactive Element
1:675,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

357

Scale on Photoactive Element
1:675,000

358

Scale on Photoactive Element
1:675,000

359

Scale on Photoactive Element
1:675,000

360

Scale on Photoactive Element
1:675,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-127-

361

Scale on Photoactive Element
1:675,000

362

Scale on Photoactive Element
1:675,000

363

Scale on Photoactive Element
1:675,000

364

Scale on Photoactive Element
1:675,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

365

Scale on Photoactive Element
1:675,000

366

Scale on Photoactive Element
1:675,000*

367

Scale on Photoactive Element
1:675,000

368

Scale on Photoactive Element
1:96,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-129-

369

Scale on Photoactive Element
1:129,000

370

Scale on Photoactive Element
1:600,000

371

Scale on Photoactive Element
1:600,000

372

Scale on Photoactive Element
1:600,000

3" IMAGE ORTHICON

CONFIDENTIAL

RM-1555
9-16-55
-130-

CONFIDENTIAL

373

Scale on Photoactive Element
1:600,000

374

Scale on Photoactive Element
1:600,000*

375

Scale on Photoactive Element
1:96,000

377

Scale on Photoactive Element
1:600,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-131-

378

Scale on Photoactive Element
1:600,000

379

Scale on Photoactive Element
1:600,000

380

Scale on Photoactive Element
1:600,000

381

Scale on Photoactive Element
1:600,000*

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-132-

382

Scale on Photoactive Element
1:600,000

382

Scale on Photoactive Element
1:600,000

384

Scale on Photoactive Element
1:600,000

385

Scale on Photoactive Element
1:600,000*

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-133-

386

Scale on Photoactive Element
1:563,000*

387

Scale on Photoactive Element
1:563,000

388

Scale on Photoactive Element
1:563,000*

389

Scale on Photoactive Element
1:563,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

M-1555
9-16-55
-134-

390

Scale on Photoactive Element
1:563,000

391

Scale on Photoactive Element
1:563,000

392

Scale on Photoactive Element
1:563,000*

393

Scale on Photoactive Element
1:563,000*

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-135-

394

Scale on Photoactive Element
1:563,000*

395

Scale on Photoactive Element
1:523,000

396

Scale on Photoactive Element
1:523,000*

397

Scale on Photoactive Element
1:523,000*

3" IMAGE ORTHICON

CONFIDENTIAL

RM-1555
9-16-55
-136-

CONFIDENTIAL

398

Scale on Photoactive Element
1:523,000*

399

Scale on Photoactive Element
1:523,000

400

Scale on Photoactive Element
1:523,000

401

Scale on Photoactive Element
1:523,000*

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-137-

402

Scale on Photoactive Element
1:523,000*

403

Scale on Photoactive Element
1:523,000*

404

Scale on Photoactive Element
1:523,000*

405

Scale on Photoactive Element
1:523,000*

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-138-

406

Scale on Photoactive Element
1:523,000*

407

Scale on Photoactive Element
1:523,000*

408

Scale on Photoactive Element
1:523,000*

409

Scale on Photoactive Element
1:523,000*

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-139-

410

Scale on Photoactive Element
1:523,000

412

Scale on Photoactive Element
1:469,000

413

Scale on Photoactive Element
1:469,000

505

Scale on Photoactive Element
1:84,000

3" IMAGE ORTHICON

CONFIDENTIAL

FM-1555
9-16-55
-140-

CONFIDENTIAL

508

Scale on Photoactive Element
1:94,000

509

Scale on Photoactive Element
1:150,000

510

Scale on Photoactive Element
1:94,000

511

Scale on Photoactive Element
1:94,000

3" IMAGE ORTHICON

CONFIDENTIAL

RM-1555
9-16-55
-141-

CONFIDENTIAL

512

Scale on Photoactive Element
1:94,000

513

Scale on Photoactive Element
1:94,000

514

Scale on Photoactive Element
1:94,000
1:94,000

515

Scale on Photoactive Element
1:94,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-142-

516

Scale on Photoactive Element
1:131,000

517

Scale on Photoactive Element
1:131,000

518

Scale on Photoactive Element
1:94,000

519

Scale on Photoactive Element
1:94,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-143-

520

Scale on Photoactive Element
1:150,000

521

Scale on Photoactive Element
1:103,000

522

Scale on Photoactive Element
1:94,000

523

Scale on Photoactive Element
1:94,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-144-

524

525

Scale on Photoactive Element
1:84,000

526

Scale on Photoactive Element
1:84,000

527

Scale on Photoactive Element
1:84,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-145-

528

Scale on Photoactive Element
1:98,000

529

Scale on Photoactive Element
1:98,000

530

Scale on Photoactive Element
1:94,000

531

Scale on Photoactive Element
1:94,000

3" IMAGE ORTHICON

CONFIDENTIAL

532

Scale on Photoactive Element
1:94,000

533

Scale on Photoactive Element
1:94,000

534

Scale on Photoactive Element
1:94,000

535

Scale on Photoactive Element
1:98,000

3" IMAGE ORTHICON

CONFIDENTIAL

RM-1555
9-16-55
-147-

CONFIDENTIAL

536

Scale on Photoactive Element
1:98,000

537

Scale on Photoactive Element
1:94,000

538

Scale on Photoactive Element
1:94,000

539

Scale on Photoactive Element
1:94,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-148-

540

Scale on Photoactive Element
1:94,000

541

Scale on Photoactive Element
1:103,000

542

Scale on Photoactive Element
1:122,000

543

Scale on Photoactive Element
1:84,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-149-

544

Scale on Photoactive Element
1:94,000

545

Scale on Photoactive Element
1:94,000

546

Scale on Photoactive Element
1:84,000

547

Scale on Photoactive Element
1:84,000

3" IMAGE ORTHICON

CONFIDENTIAL

RM-1555
9-16-55
-150-

CONFIDENTIAL

548

Scale on Photoactive Element
1:103,000

549

Scale on Photoactive Element
1:94,000

550

Scale on Photoactive Element
1:94,000

3" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-151-

1

Scale on Photoactive Element
1:516,000*

4

Scale on Photoactive Element
1:516,000

6

Scale on Photoactive Element
1:480,000

7

Scale on Photoactive Element
1:480,000

4 $\frac{1}{2}$ " IMAGE ORTHICON

CONFIDENTIAL

RM-1555
9-16-55
-152-

CONFIDENTIAL

12

Scale on Photoactive Element
1:432,000

15

Scale on Photoactive Element
1:420,000

18

Scale on Photoactive Element
1:384,000

20

Scale on Photoactive Element
1:360,000

4 $\frac{1}{2}$ " IMAGE ORTHICON

CONFIDENTIAL

RM-1555
9-16-55
-153-

CONFIDENTIAL

23

Scale on Photoactive Element
1:336,000*

28

Scale on Photoactive Element
1:300,000

32

Scale on Photoactive Element
1:180,000

36

Scale on Photoactive Element
1:150,000

4½" IMAGE ORTHICON

CONFIDENTIAL

CONFIDENTIAL

RM-1555
9-16-55
-154-

38

Scale on Photoactive Element
1:150,000

45

Scale on Photoactive Element
1:120,000

55

Scale on Photoactive Element
1:120,000

4½" IMAGE ORTHICON

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